

Benfluralin Summary

February 11, 2003

Uses

- Benfluralin is an herbicide of the dinitroaniline family that is applied pre-emergence to control weeds. It is registered for use to control grasses (including johnsongrass seedlings), chickweed, lambsquarters, purslane, knotweed, clover, pigweed, and plantain. It is used as a herbicide on a single food crop (pre-plant on lettuce), feed crops (pre-plant on alfalfa, clover, trefoil), non-bearing fruit and nut trees, non-bearing berries, non-bearing vineyards, turf, ornamentals, rights-of-way, hedgerows/fencerows, and Christmas tree plantations.
- There are tolerances for benfluralin on alfalfa, birdsfoot trefoil, clover, and lettuce. A tolerance for peanuts is not being supported by the registrant and will be proposed for revocation by the Agency.
- Benfluralin is also registered as an insecticide for controlling *Poa annua* decline disease in turf.

Health Effects

- Benfluralin is a growth inhibitor (mitotic disruptor).
- Placed in Category III, IV, and III, for oral, dermal, and inhalation toxicity, respectively. Benfluralin is placed in toxicity category III for eye and dermal irritation. Technical benfluralin may be a skin sensitizer but formulated benfluralin products do not show skin sensitization effects.

Dietary Risk

- Acute dietary risk has not been assessed for benfluralin because an appropriate endpoint attributable to single dose was not identified. Thus, an acute RfD/aPAD was not established due to the low acute toxicity of benfluralin.
- The chronic dietary risk (food) for benfluralin does not exceed the Agency's level of concern (i.e., less than 100% of the chronic PAD is utilized).

Drinking Water

- Acute exposure from drinking water is not of concern, as no appropriate endpoint from a single dose has been identified.
- The EEC estimates for benfluralin and degradates (surface water 0.17 - 3.5 ppb; ground water 0.009 - 0.07 ppb) are less than the estimated DWLOC (50 ppb for children; > 100 ppb for adults), and a conclusion can be drawn that no adverse toxicological effect will occur due to chronic exposure from food and drinking water.

Residential Risk

- Risk to the Residential Applicator (Handler) does not exceed the Agency's level of concern in

that all MOEs are above 100, EPA's level of concern for benfluralin. MOEs range from 22,000 - 11,000,000.

- The MOEs for each residential post-application exposure scenario (2,200 - 670,000) are well above 100 and therefore considered to be adequately protective.
- Risks from dermal exposure can not be adequately quantified because a NOAEL for systemic dermal toxicity could not be established from a dermal study of technical benfluralin. Nonsystemic dermal effects were observed, but no systemic effects were seen at any dose level. Relatively few incidents of potential sensitization have been reported due to benfluralin.

Aggregate Risk

- The Agency has concluded that no adverse toxicological effect will occur due to aggregate short-term or aggregate chronic exposure, as all EEC estimates are less than estimated DWLOCs.

Worker Risk

- Benfluralin MOE estimates for occupational handler scenarios are greater than 100 (in the range of 290 - 900,00) at the baseline level of risk mitigation (i.e., long-sleeve shirt, long pants, shoes, and socks) based on inhalation exposure.
- Risks from dermal exposure can not be adequately quantified because a NOAEL for systemic dermal toxicity could not be established from a dermal study of technical benfluralin. Nonsystemic dermal effects were observed, but no systemic effects were seen at any dose level. Relatively few incidents of potential sensitization have been reported due to benfluralin.
- Because benfluralin uses are varied, a wide array of individuals can potentially be exposed by working in areas that have been previously treated. However, since no dermal endpoint has been identified for systemic toxicity, no occupational post-application exposure and risk assessment is required.

Ecological Risk

- Ecological risk is difficult to characterize due to outstanding data gaps. There are potential reproductive and chronic effects in birds and small mammals and potential reproductive effects for nontarget aquatic animals. There is much uncertainty in the non-target plant risk assessment. There are potential acute and chronic risks to endangered species on many benfluralin use sites.
- Parent benfluralin is not expected to leach into groundwater, as it is immobile in soil. However, it has 26 identified degradates that are expected to be mobile in soil and may contaminate water. Benfluralin is expected to be bioaccumulative.